

WHAT IS CLAIMED IS

We claim:

1. A surgical fastener instrument comprising:

a handle;

5 an elongated member extending distally from the handle, the elongated member defining a longitudinal axis extending the length of the elongated member, the elongated member having an offset distal end portion angularly arranged at a predetermined angle with respect to the longitudinal axis; and

10 a fastener applying mechanism mounted to the offset distal end portion of the elongated member, the fastener applying mechanism having at least one fastener adapted to be driven into tissue.

2. The surgical fastener instrument of claim 1 including a
15 proximal actuator mounted to the handle and operatively connected to the fastener applying mechanism, the actuator movable relative to the handle to actuate the fastener applying mechanism.

3. The surgical fastener instrument of claim 2 wherein the
20 proximal actuator includes a fastener firing lever depending from the frame to define a pistol grip configuration, the firing lever being dimensioned for engagement by the fingers of the operator.

4. The surgical fastener instrument of claim 2 wherein the fastener applying mechanism includes a fastener holder and an anvil, the fastener holder and the anvil adapter for relative movement between an open position and an approximated position.

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5. The surgical fastener instrument of claim 4 including an approximating mechanism for moving the fastener holder and the anvil between the open position and an approximated position.

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6. The surgical fastener instrument of claim 5 wherein the fastener applying mechanism includes a flexible cable extending within the elongated member and operatively connected to the proximal actuator.

7. The surgical fastener instrument of claim 5 including a proximal approximator mounted to the handle and operatively connected to the approximating mechanism, the approximator movable relative to the handle to actuate the approximating mechanism.

8. The surgical fastener instrument of claim 7 wherein the approximating mechanism includes a flexible cable extending within the elongated member and operatively connected to the proximal approximator.

9. The surgical fastener instrument of claim 7 wherein the fastener holder and the anvil define a general U-shaped structure, the anvil being on a distal leg of the U-shaped structure and the fastener holder being on the proximal leg of the U-shaped structure, the anvil and the fastener holder being adapted for relative movement to clamp tissue to be fastened between the fastener holding part and the anvil part when in the approximated position.

10. The surgical fastener instrument of claim 9 wherein at least one of the fastener applying mechanism and the approximating mechanism includes a "scissor jack" type toggle linkage, the "scissor jack" type toggle linkage being operatively connected to the respective proximal actuator or proximal approximator.

11. The surgical fastener instrument of claim 9 wherein at least one of the fastener applying mechanism and the approximating mechanism includes a crank mechanism, the crank mechanism further including a cam arrangement, said cam arrangement further includes a plurality of cam slots, levers, and pins to actuate the respective mechanism.

12. The surgical fastener instrument of claim 9 wherein at least one of the fastener applying mechanism and the approximating mechanism includes a ball drive arrangement, the ball drive arrangement including an eccentric bearing and a hex or ball drive engageable with the eccentric bearing,

the bearing rotatable to drive a pusher to actuate the respective fastener applying or approximating mechanism.

13. The surgical fastener instrument of claim 9 wherein at least
5 one of the fastener applying mechanism and the approximating mechanism includes a gear arrangement having a plurality of gears, the gear cooperating to actuate the respective fastener applying or approximating mechanisms.

14. The surgical fastener instrument of claim 1 wherein the
10 predetermined angle of the offset distal end of elongated member is in the range from about 0° to about 90°.

15. The surgical fastener instrument of claim 14 wherein the
predetermined angle is about 45°.
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16. The surgical fastener instrument of claim 14 wherein the
predetermined angle is about 60°.

17. The surgical fastener instrument of claim 14 wherein the
20 predetermined angle is about 75°.

18. The surgical fastener instrument of claim 3 wherein the
fastener applying mechanism includes a knife, the knife further including a finger
5 tab for manual operation.

19. A surgical fastener instrument comprising:
a handle;
an elongated member extending distally from the handle, the
10 elongated member defining a longitudinal axis extending the length of the
elongated member, the elongated member having an offset distal end wherein
said offset distal end is in parallel relation to the lateral axis of the instrument;
a fastener applying mechanism mounted to the offset distal end
of the elongated member, the fastener applying mechanism having at least one
15 fastener; and
a proximal actuator assembly including means for firing at least
one fastener.